RESTORE Council FPL 3 Proposal Document

## General Information

*Sponsor:*
Alabama Department of Conservation and Natural Resources

*Title:*
Enhancing Hydrologic Connectivity in Justin's Bay (Mobile Bay)

*Project Abstract:*
Alabama, through the Alabama Department of Conservation and Natural Resources (ADCNR), is requesting $1M in Council-Selected Restoration Component funding for the proposed Enhancing Hydrologic Connectivity in Justin's Bay (Mobile Bay) project. This request includes planning funds as FPL Category 1. The proposed project builds on a previous study of the Mobile Bay Causeway and hydrology conducted in 2015, and will support the primary RESTORE Comprehensive Plan goal to restore and conserve habitat through a planning effort that would: 1) address any data gaps remaining from the 2015 study, 2) evaluate the suggested restoration alternatives with a cost-logistics/feasibility frame of reference, and 3) move identified and prioritized restoration alternatives forward to a 30% preliminary engineering design.

The construction of the Mobile Bay Causeway in 1927 resulted in a significant amount of dredge material placement over large portions of the Upper Mobile Bay marsh complex. At the time, filling of marsh was a preferred alternative to elevating the causeway and as a result, restrictions of hydrological interaction and connections between Mobile Bay and its Delta, including faunal migrations and natural food web interactions have been curtailed. Proposed project activities will inform the restoration of the hydrological exchange necessary for coastal marsh and estuarine wetland habitats in the area to maintain ecological integrity and ecosystem health. Program duration is expected to be 3 years.

*FPL Category:* Cat1: Planning Only

*Activity Type:* Project

*Program:* N/A

*Co-sponsoring Agency(ies):*
AL

*Is this a construction project?:*
No

*RESTORE Act Priority Criteria:*
(III) Projects contained in existing Gulf Coast State comprehensive plans for the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.
(IV) Projects that restore long-term resiliency of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands most impacted by the Deepwater Horizon oil spill.

*Priority Criteria Justification:*
#3: Projects contained in Comprehensive plans: The State of Alabama has invested significant funds into the development of comprehensive plans through both NFWF-GEBF as well as RESTORE (FPL 1) funding streams. These comprehensive plans contain specific restoration alternatives and priorities that identify the restoration and protection of coastal marsh ecosystems as well as the restoration of hydrological connections within Mobile Bay as priorities.

#4: Projects that restore long-term resiliency: This area of estuarine wetland – coastal marsh in Mobile Bay, essentially the intersection of the Mobile Bay and its Delta has had hydrological connections significantly curtailed for almost a century. Restoration of hydrological connectivity is critical to ensure the long term resilience of the coastal marsh complex, especially as freshwater flow variability changes and weather related storm events increase in frequency and intensity.

*Project Duration (in years):* 3

## Goals

*Primary Comprehensive Plan Goal:*
Restore and Conserve Habitat

*Primary Comprehensive Plan Objective:*
Restore , Enhance, and Protect Habitats

*Secondary Comprehensive Plan Objectives:*
N/A

*Secondary Comprehensive Plan Goals:*
N/A

*PF Restoration Technique(s):*
Restore hydrology and natural processes: Restore hydrologic connectivity

## Location

*Location:*
Coastal Alabama; Mobile and Baldwin Counties

*HUC8 Watershed(s):*
South Atlantic-Gulf Region(Mobile-Tombigbee) - Mobile Bay-Tombigbee(Mobile-Tensaw)

*State(s):*
Alabama

*County/Parish(es):*
AL - Baldwin
AL - Mobile

*Congressional District(s):*
AL - 1

## Narratives

*Introduction and Overview:*

The Enhancing Hydrologic Connectivity in Justins Bay (Mobile Bay) project (the Project) will support the restoration of hydrological connectivity and restore natural ecological function to areas of estuarine habitats in Mobile Bay. The construction of the Mobile Bay Causeway (Causeway) in 1927 resulted in a significant amount of dredge material placement over large portions of the Upper Mobile Bay marsh complex. At the time, filling of marsh was a preferred alternative to elevating the causeway and as a result, restrictions of hydrological interaction and connections between Mobile Bay and its Delta, including faunal migrations and natural food web interactions have been curtailed. In 2015 the Alabama Department of Conservation and Natural Resources (ADCNR) commissioned a study of the north and south regions of the Mobile Bay Causeway consisting of a historical data compilation effort, collection and analyses of sediment cores looking at sediment contaminant concentrations, ecosystem field surveys and associated hydrodynamic modelling of potential restoration alternatives. The study defined multiple restoration alternatives, including their conceptual design sheets, conceptual cost estimate calculations, and potential construction schedules. Additionally, this study identified data gaps that need to be filled prior to E&D, permitting, and implementation of restoration alternatives.

This project would be a planning effort to: 1) address data gaps remaining from the 2015 study, including a fine scale evaluation of sediments, and additional salinity and flow data collection as needed, as well as ensuring that the hydro-dynamic modelling captures current hydrological conditions, 2) evaluation of restoration alternatives with a cost-logistics frame of reference, including an evaluation of the cost of utility modifications and 3) move identified and prioritized restoration alternatives forward to 30% preliminary engineering design.

The Project addresses the Restore Council Comprehensive Plan Goal #1: Restore and Conserve Habitat. The Project will plan for the restoration and conservation of habitat within Alabama coastal waters, including priority bays and estuaries associated with the Mobile Bay system. The activity of the project, planning for the enhancement of hydrological connectivity, is consistent with RESTORE Councils primary objective of Restore, Enhance, and Protect Habitats.

Under the 2016 Comprehensive Plan update the Council advanced the following commitments:

- Regional ecosystem-based approach to restoration: There have been several sentinel documents on strategies to coastal restoration that highlight hydrological connectivity as a priority investment to an ecologically and economically sustainable coastal habitat. The Gulf Coast Ecosystem Restoration Task Force (GCERT, 2016) identified restoring and conserving nearshore habitats as a major action across the Gulf, under one of the four main restoration goals.
- Leveraging resources and partnerships: Building and leveraging on the 2015 study, this project would identify and fill gaps in information so that specific restoration alternatives can be brought forward that have considered all cost and logistical variables. All modelling work, data assimilation and compilation from the 2015 study would be used to maximize planning work and progress towards 30% preliminary E&D.
- Engagement, Inclusion, and Transparency: From the outset, ADCNR and the State of Alabama has been engaged with the public to prioritize coastal restoration. Within the MBNEP stakeholder engagement efforts for the CCMP and watershed management plan development, habitat enhancements including wetland restoration and hydrological connectivity were central tenets that also represent priority restoration activity.
- Science-based decision-making: Utilizing the best available science through the project's planning component, as well as relying on previous investments from the study of hydrological impacts in Mobile Bay, ADCNR would optimize design plans for construction to provide the most ecological benefit and reduce impacts to species and habitats in the area.

- Delivering results and measuring impacts: The proposed project would utilize work plans that would adhere to the site-specific milestones of the project. These would be documented in observational data management plans and tracked accordingly.

Environmental Benefits: It is well understood in the scientific literature that appropriate hydrological exchange is necessary for coastal marsh and estuarine wetland habitats to maintain ecological integrity and ecosystem health, as well as functioning to provide a variety of ecosystem service benefits to the system. The degree of hydrological connectivity can be a significant driver in the movement and flux of energy, organisms, and nutrients within a marsh landscape (Goecker, 2009; Roberts, 1997; Smith, 1988). A specific function of estuarine wetlands is to serve as nursery habitat for open water and estuarine dependent marine resources, to which hydrological connectivity determines the strength and integrity of that function (Swannack et al., 2019). Restoration of hydrological connectivity is critical to ensuring the long-term resilience of the coastal marsh complex, especially as freshwater flow changes and weather-related storm events increase in frequency and intensity. Robust planning is essential to the success of a large-scale project that would ultimately have a positive impact on water quality. Investing in planning now is cost-effective and increases the likelihood of success for future efforts to restore hydrologic connectivity.

Environmental Stressors: In the lower section of the Mobile-Tensaw Delta, a large causeway built in the mid to late 1920s has blocked a number of once-open bays from contact with Mobile Bay and the Gulf. By altering the seasonal variation and volume of flows, these hydrological modifications have altered the ecological function and biodiversity of one of North America's largest, most productive and diverse estuaries, on a local and system-wide basis (Valentine and Sklenar, 2006). Evidence has been found in similar situations around the world that show significant ecological changes can occur when natural hydrography is altered (Sabater and Tokner, 2009). In the Mobile Bay area, hydrological modification has affected nekton densities and assemblage structure (Rozas et al., 2013), reduced salt and fresh water exchange and altered circulation patterns (Martin and Valentine, 2012), resulting in changes in nutrient cycling (Goecker et al., 2009), frequency of occurrence and persistence of hypoxic events, and increased incidences of exotic and invasive plant species (Kauffman et al, 2018).

Total Cost: $1,000,000.

Timeline: 3 years

Partners: ADCNR will work and partner with the City of Spanish Fort, utility associations, and regulatory agencies to carry out project objectives.

This project aligns with the FPL3 Planning Framework priority approaches and techniques for Alabama by addressing the approach Restore hydrology and natural processes and technique Restore hydrologic connectivity. Additionally, the proposed project builds off of previous investments from the U.S. Fish and Wildlife Service, Department of the Interior through the Coastal Impact Assistance Program (CIAP).

### *Proposed Methods :*

The proposed project will include the following primary activities:

<u>Program Administration</u>

Program administration will cover all activities associated with the project. ADCNR personnel and its contractors will provide administrative programmatic functions and/or support during the life of the grant. ADCNR (with contractual support) will undertake program management, coordination and

monitoring activities to ensure compliance with all grant agreement terms and conditions, 2 C.F.R. Part 200, 31 C.F.R. Part 34, the RESTORE Council's Standard Terms and Conditions, applicable Special Award Conditions, and applicable federal, state and local laws and regulations. ADCNR, with contractual support, will also manage the data associated with this project in accordance with the procedures outlined in the Observational Data Plan and the Data Management Plan.

Planning, Permitting and E&D

The planning component of the project will address any data gaps remaining from the 2015 study. A detailed gap analysis study will provide guidance for any critical data pieces needing to be collected before engineering and design take place. Data gap collection includes, but is not limited to, a fine resolution spatial delineation and extent of sediment contaminants in the restoration area; ecological impact studies; hydrodynamic modelling review; wave action modeling; water quality evaluation of the restoration area including potential changes to water temperature, salinity, and other parameters; and, coordination with utility owners to optimize engineering designs.

Engineering, design, and identification of permitting requirements of the identified solutions will utilize and apply standard engineering practices for similar projects, including certified and sealed plans. Engineering and design services will provide the alternatives to enhance hydrological connectivity between Justins Bay, north of the Causeway, and Mobile Bay, south of the Causeway. Anticipated future conditions related to climate change, specifically sea level rise, will be considered throughout the design process. Current and future traffic conditions will also be taken into account throughout the project. ADCNR will coordinate activities to determine design techniques for further development based on conditions specific to the project area and Best Available Science related to direct and indirect ecological benefits, including existing data and information obtained from relevant watershed management plans developed by the Mobile Bay National Estuary Program. ADCNR will identify one or more hydrological enhancement options to further develop 30% preliminary engineering and design through this project. Through this project, an opinion of probable cost will be developed to inform project construction, which is not included in the current scope of work for this project.

The preparation of preliminary engineering design plans must consider environmental permitting paths. Thus, this effort should include progressing the environmental permitting components to include determining the permits required, mitigation requirements (if applicable), and other environmental permitting considerations that may affect the engineering design and construction scheduling. The appropriate state/federal agencies will be engaged in order to understand permitting requirements for the respective design plans. Project design elements will be considered to maximize habitat quality as it relates to federally managed fish species. Further, design will take into consideration best management practices to ensure marine mammals and threatened or endangered species are not impacted. Additional activities may include environmental compliance testing of sediments, geotechnical investigations and other needs associated with site design.

### *Environmental Benefits:*

Increased flushing and tidal communication will improve hydrology in Justins Bay (ADCNR, 2015). Hypoxia and anoxia occur naturally in estuarine systems, particularly in enclosed embayments such as Justin's Bay. With constructed openings that increase flushing and reduce retention time, episodic hypoxia and anoxia in these bays may be less frequent during warm seasons compared to the current condition (Kaufmann et al., 2018). Tidal exchange will tend to equalize salinities in the areas of influence north and south of the Causeway during periods of low river flow. The hydrodynamic modeling indicates that tidal exchange will be reduced at higher river discharge due to a general reduction of tidal forcing. During high flow conditions, freshwater dominates the delta and is likely to mask tidal exchange effects at Causeway openings. Salinity changes due to the project may not

result in measurable differences in the distributions of the predominant flora and fauna of the study area, since these groups tend to have wide salinity tolerances.

Hydrologic connectivity established by constructed openings will provide corridors for a variety of aquatic fauna migrating between upper Mobile Bay and Justins Bay (Rozas et al., 2013). Access to the SAV and fringing tidal marshes north of the Causeway will potentially increase larval and juvenile densities of important estuarine-dependent species at these locations, compared to the current condition (ADCNR, 2015). In general, the Causeway impedes faunal migration and has altered natural food web interactions in its immediate vicinity (Goecker et al., 2009). The constructed opening will restore natural function to the adjacent areas and increase wave action and mixing, which could have positive benefit to native submerged vegetation by introducing the incursion of wind-driven waves into oligohaline embayments north of the causeway that is currently over-populated with Eurasian milfoil (Martin and Valentine, 2012).

*Metrics:*

Metric Title: PRM010 : Research - # studies used to inform mgmt.
Target: 1
Narrative: The number of studies completed whose findings are used to adapt management/ inform management. decisions.

Metric Title: PRM011 : Restoration planning/design/permitting - # E&D plans developed
Target: TBD
Narrative: The number of E&D plans will indicate the number of projects moved forward to implementation.

*Risk and Uncertainties:*
As this is a planning project that will result in a better understanding of how to restore hydrological connectivity to Justins Bay, few risks are expected. Planning and engineering design based on scientific knowledge will support avoidance of risks and uncertainties and result in the appropriate design alternatives to provide an increase in ecological function in the area. A risk involved from a regulatory perspective will be time required for the permitting process and the potential risk the Project will not get permitted. ADCNR has experience implementing engineering, design and permitting of projects through various restoration funding and will work with the relevant permitting and resource agencies to identify issues which may impact permitting and adjust accordingly. Engineering and design specifications of restoration alternatives may be adjusted based on permitting conditions.

*Monitoring and Adaptive Management:*
There is no monitoring associated with this project. Project outcomes including engineering designs and gap analysis studies will be tracked through the project's observational data plan and data management plan.

*Data Management:*
Data reporting will occur every six months, and observational data reports will be developed and submitted in compliance with the grants reporting cycle as outlined in the RESTORE Council Financial Assistance Standard Terms and Conditions and Part IV, Section G of the Recipient Guideline. Following completion of all data collection, a final observational data report will be prepared and distributed. ADCNR will store, archive and provide project data and make them publicly available on DCNR's coastal restoration website: https://www.alabamacoastalrestoration.org/.

*Collaboration:*
Through the FPL collaborative planning process, Alabama has identified an opportunity for estuarine restoration. This work has foundations in previous planning and research work including the 2015 feasibility study already mentioned in addition to other impact studies over the last two decades that have addressed hydrologic connectivity on the lower Mobile-Tensaw Delta (Byrnes et al.,2013; Valentine and Sklenar, 2006). The State of Alabama has invested significant funds into the development of comprehensive plans through both NFWF-GEBF as well as RESTORE (FPL 1) funding streams that contain specific restoration alternatives and priorities that identify the restoration and protection of coastal marsh ecosystems as well as the restoration of hydrological connections within Mobile Bay as priorities. The plans included grassroots engagement of coastal Alabama stakeholders to determine priorities as well as potential restoration actions and activities to address those priorities.

*Public Engagement, Outreach, and Education:*
The State of Alabama's prioritization of the Project is based on multiple public and stakeholder engagement activities. Throughout Alabama's restoration public engagement and planning efforts, stakeholders have consistently identified the restoration and protection of coastal habitats as a top priority. The following are examples of public engagement, outreach and education activities which were considered in the selection of this proposal:

Alabama Restoration Summit: ADCNR hosted the Alabama Restoration Summit in 2018. The public was invited to learn about restoration projects and programs and to provide input on current and future priorities for restoration. Based on the public input received, investing in coastal habitat restoration and protection continues to be a top priority of stakeholders.

Alabama Watershed Management Plans (NFWF-GEBF; RESTORE): Starting in 2013, the Mobile Bay National Estuary Program (MBNEP) has published several coastal watershed management plans (WMPs) that provide guidance for restoration. These plans depend upon public involvement and "stakeholders" who know the area, recognize its problems, and are invested in its health and resilience. Each plan includes a watershed description that educates communities about the geography, geology, biology, ecology, and hydrology of the drainage area's land and water. Although stakeholder engagement and education strategies are unique across WMPs, all of the plans have included stakeholder community meeting to gather feedback from the public

RESTORE Act Alabama State Expenditure Plan: ADCNR has solicited stakeholder input to support planning and development of the Alabama State Expenditure Plan (MSEP). Engagement with a wide range of stakeholders, including private citizens, non-governmental organizations, business owners, elected officials, and other community leaders, has informed the priorities for restoration.

*Leveraging:*

Funds: $500,000.00
Type: Bldg on Others
Status: Received
Source Type: Other Federal
Description: This project conducts a feasibility investigation relating to hydrologic restoration of certain areas of upper Mobile Bay/lower Mobile Tensaw Delta along the Mobile Bay Causeway (US 90/98) including the Justins Bay area.

*Environmental Compliance:*
Council approval of funding for this activity would not involve or lead directly to ground-disturbing activities that may have significant effects on the environment individually or cumulatively, nor does it commit the Council to a particular course of action affecting the environment. In the environmental compliance review, the Council would considered potential extraordinary circumstances, including potential negative effects to threatened and endangered species, essential fish habitat, Tribal interests, and/or historic properties, where applicable, and could determine that no such circumstances apply. Accordingly, the Council could also determine that this activity is covered by the Council's National Environmental Policy Act (NEPA) Categorical Exclusion (CE) for planning, research or design activities (Section 4(d)(3) of the Council's NEPA Procedures).

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## Budget

*Project Budget Narrative:*
A total of $1,000,000 is being requested from FPL 3a to fund planning, gap analysis work, and develop 30% engineering and design for possible alternatives. An estimated 98% of this request is for project planning. Project planning will include, but is not limited to: project administration and management, including administrative programmatic functions, coordination, and sub-recipient / contractual support for project implementation; planning associated with identifying respective solutions, including gap analysis work, geo-tech, sediment sampling, etc.; engineering and design up to a 30% benchmark for identified solution(s); possible identification of permitting requirements associated with identified solution(s). An estimated 2% is being requested for data management activities. No funds are being requested for contingency, monitoring and adaptive management activities, or implementation.

*Total FPL 3 Project/Program Budget Request:*
$ 1,000,000.00

*Estimated Percent Monitoring and Adaptive Management:* 0 %
*Estimated Percent Planning:* 98 %
*Estimated Percent Implementation:* 0 %
*Estimated Percent Project Management:* 0 %
*Estimated Percent Data Management:* 2 %
*Estimated Percent Contingency:* 0 %

*Is the Project Scalable?:*
No

*If yes, provide a short description regarding scalability.:*
N/A

## Environmental Compliance[1]

| Environmental Requirement | Has the Requirement Been Addressed? | Compliance Notes (e.g.,title and date of document, permit number, weblink etc.) |
|---|---|---|
| **National Environmental Policy Act** | Yes | These planning activities are covered by the Council's NEPA Categorical Exclusion for planning, research or design activities (Section 4(d)(3) of the Council's NEPA Procedures). |
| **Endangered Species Act** | N/A | Note not provided. |
| **National Historic Preservation Act** | N/A | Note not provided. |
| **Mangnuson-Stevens Act** | N/A | Note not provided. |
| **Fish and Wildlife Conservation Act** | N/A | Note not provided. |
| **Coastal Zone Management Act** | N/A | Note not provided. |
| **Coastal Barrier Resources Act** | N/A | Note not provided. |
| **Farmland Protection Policy Act** | N/A | Note not provided. |
| **Clean Water Act (Section 404)** | N/A | Note not provided. |
| **River and Harbors Act (Section 10)** | N/A | Note not provided. |
| **Marine Protection, Research and Sanctuaries Act** | N/A | Note not provided. |
| **Marine Mammal Protection Act** | N/A | Note not provided. |
| **National Marine Sanctuaries Act** | N/A | Note not provided. |
| **Migratory Bird Treaty Act** | N/A | Note not provided. |
| **Bald and Golden Eagle Protection Act** | N/A | Note not provided. |
| **Clean Air Act** | N/A | Note not provided. |
| **Other Applicable Environmental Compliance Laws or Regulations** | N/A | Note not provided. |

[1] Environmental Compliance document uploads available by request (restorecouncil@restorethegulf.gov).

## Maps, Charts, Figures


Figure 1 : Map of Project Area